Claims

1. A premix burner (1) for burning a low-calorie combustion gas (SG), with a premix air duct (2) extending along a burner axis (12), via which combustion air (10) can be supplied, and with a helical device (5) disposed in the premix air duct (2), with an injection device (13) for the low-calorie combustion gas (SG) being disposed downstream from the helical device (5) in the flow direction (21) of the combustion air (10).

2. The premix burner (1) as claimed in claim 1, wherein the injection device (13) has a number of inlet openings (16) for combustion gas (SG), which open into the premix air duct (2).

3. The premix burner (1) as claimed in claim 2, wherein the inlet openings (16) for the combustion gas (SG) are formed such that the formation of wake regions (19) in the premix air duct (2) is prevented.

4. The premix burner (1) as claimed in claim 3, wherein the inlet openings (16) for the combustion gas (SG) have a cross-section (18), the cross-section (18) having a longitudinal extension (L_1) and a transverse extension (L_2), the longitudinal extension (L_1) being greater than the transverse extension (L_2).

5. The premix burner (1) as claimed in claim 4, wherein the longitudinal extension (L_1) is 3 to 10 times the transverse extension (L_2).

6. The premix burner (1) as claimed in claim 4 or claim 5, wherein the cross-section (18) of the inlet openings (16) has

the form of a slot (16b) or a rectangle with rounded corners or a teardrop.

7. The premix burner (1) as claimed in one of claims 4, 5 or 6,
wherein the longitudinal axis (A) defined by the longitudinal extension (L_1) is essentially parallel to the flow direction (12) of the combustion air (10).

8. The premix burner (1) as claimed in one of the preceding claims,
wherein the flow direction (21) of the combustion air (10) is at an angle (ϕ) to the burner axis (12), where $0° < \phi < 90°$.

9. The premix burner (1) as claimed in one of the preceding claims,
wherein the injection device (13) has at least one gas distribution ring (17), which encloses the premix air duct (2) in a radially outward or radially inward manner.

10. The premix burner (1) as claimed in claim 9,
wherein the premix air duct (2) is configured as an annular duct (14), having an outer or inner duct wall (15), which is punctuated by a number of inlet openings (16), which are connected for flow purposes to the gas distribution ring (17).

11. The premix burner (1) as claimed in claim 10,
with an outer duct wall (15) tapering in a cone shape in the flow direction (21) of the combustion air (10).

12. A combustion chamber with a premix burner (1) as claimed in one of the preceding claims.

13. A gas turbine with a combustion chamber as claimed in claim 9.

14. A method for burning a low-calorie combustion gas (SG), wherein the combustion air (10) is swirled, low-calorie combustion gas (SG) is injected into the swirling combustion air (10) and mixed with it and the mixture is burned.

15. The method as claimed in claim 14, wherein partially diluted combustion gas (SG) is injected into the swirling combustion air (10).

16. The method as claimed in claim 14 or claim 15, wherein the low-calorie combustion gas (SG) is injected such that the formation of wake regions (19) in the premix air duct (2) is prevented.

17. The method as claimed in claim 16, wherein the low-calorie combustion gas (SG) is injected through inlet openings (16) and these inlet openings (16) have a cross-section (18), the cross-section (18) having a longitudinal extension (L_1) and a transverse extension (L_2), the longitudinal extension (L_1) being greater than the transverse extension (L_2).

18. The method as claimed in claim 17, wherein the longitudinal axis (A) defined by the longitudinal extension (L_1) is essentially parallel to the flow direction (21) of the combustion air (10), such that the low-calorie combustion gas (SG) is injected parallel to the flow direction of the combustion air (10).

19. The method as claimed in one of claims 14 to 17, wherein the low-calorie combustion gas (SG) used is a gasified fossil fuel, in particular gasified coal.

20. The method as claimed in one of claims 14 to 19, which is implemented during operation of a gas turbine burner.